## **Sterling - Energy Listening Session Summary**

The eighth and last listening session was held in Sterling on Monday, August 26, 2013. The session was attended by 15 industry participants and four staff from partner agencies. The attendees are listed in the table below. Please note that this summary does not reflect the opinion of the State of Colorado, but rather provides a summary of comments from attendees that were with businesses and other non-state agency organizations.

# **Energy Efficiency Trends - Discussion Points**

- Irrigation for agriculture makes up the primary share of Highline Electric Association's (HEA) and Y-W Electric Association's (Y-W) load. During the winter months, Y-W's load is about 30 MW and during the summer months it grows to 135 MW the increase is due entirely to irrigation energy consumption. Irrigation makes up 55% to 60% of total kWh sales for Y-W. HEA has a similar load profile to Y-W. Residential energy consumption makes up a small portion of the northern Eastern Plains's load for rural electric associations (REAs) and should not be the focus of energy efficiency programs. Increased energy efficiency should target irrigation improvements in the region that would result in cost savings for farmers.
- Farms in the region have recently been working with high and low pressure sprinklers to save money. Increased savings with regards to irrigation equipment may still be found by focusing on pumping plan efficiency.
- Research on irrigation efficiency has been conducted at Colorado State University (CSU) and the U.S.
  Department of Agriculture's (USDA) agricultural research stations. Among these research stations
  there is a site near Yuma that has focused on irrigation research. The Yuma station has researched
  variable rate irrigation systems and conducted testing with compost and organic matter for water
  retention.
- The State of Nebraska conducts much more irrigation research than Colorado. The University of Nebraska could be a good resource for irrigation research studies. In looking at Nebraska's research, it should be noted that Colorado's irrigation is drawn from more diverse sources than Nebraska.
- A Kansas State University program has conducted research on drip irrigation that would be of interest for the region to explore further.
- Irrigation pumps have become more efficient over time in the region. Some wells are now using variable speed controls. Variable speed pumps are effective when the load output of the motor needs to change, which can occur frequently on wells running two sprinklers.
- The cost of upgrading to a more efficient irrigation motor could be \$10,000 to \$15,000. Work can be
  done to refurbish motors and make them more efficient at a lower expense than upgrading to a new
  motor.
- There are vendors in the region available for soil mapping technologies, but this can be expensive, and they may be unproven technologies. Using soil mapping technology to a farm's advantage would require variable speed technology upgrades to the entire irrigation system which could cost as much as \$100,000 to \$150,000.

- Pumping water out of wells takes a lot more energy than if you are pumping out of a ditch or a pond. A potential high priority target for efficiency improvement in the region should be irrigated farms using wells.
- There are opportunities for significant gains in irrigation efficiency in the regions, but achieving those gains is related to cost. Farmers in the region will be looking to see if funding is available to make their systems more efficient.
- Currently, interactions such as irrigation audits and system analysis are occurring primarily between the farmer and the vendor.
- The potential "game changer" technology for irrigation efficiency in the future could be low cost drip irrigation systems.
- In the last year, the recent demand side management programs for irrigation are no longer being utilized by farms in the region. At the local level, load control programs have been effective, but the trend is currently focused on the efficiency of the larger Tri-State Generation and Transmission (Tri-State) system. Tri-State recently lowered the amount of the incentive for farms to participate in a local REA demand side management programs. The region believes there will be further changes to these programs in the months ahead.
- HEA's system operates in both the Eastern Grid and Western Grid of the United States. Tri-State
  provides power on both sides as well to member REAs. In looking at demand side management and
  efficiency, there are reasons to expand the outlook to include a wider level analysis of the whole
  system involving both major grid systems.

#### **Advancements in Production - Discussion Points**

- Small head hydro has the potential to be developed in the region. There is interest in working with the Colorado Energy Office to determine the most effective way to use power from canals and reservoirs in the region. The technology would be well suited to water system infrastructure that is moving water before it reaches the farm. Systems that could be installed may have a capacity of 1 MW or less.
- The North Sterling Outlet is 68 miles long with water drops of 200-500 cubic ft. per second. The outlet loses approximately half of its water at about the halfway point. However, at the beginning of the outlet, there are sites that could generate power on a small scale. In addition, there are distribution lines in close proximity to the water flow that could allow for reasonable interconnection opportunities. The cost for the development of small hydropower systems could be a barrier, and there would likely need to be an agreement with the reservoir company to allow for development.
- One important aspect for small hydro power in the region is that it would help match the seasonal load with high demand during irrigation season. The water power could be used at the same time irrigation power demand peaks in the summer. The region needs help identifying technology or policies that would advance small hydro power development.
- Higher prices for oil are stimulating more production in the state. In order to fully realize the market
  that Colorado has for oil production, it will be important to effectively export the product out of the
  state. There is a need for additional pipelines to support the export market. The oil and liquids plays

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have a higher market value on the Gulf Coast, and the region's oil could be more profitable with exports to that part of the country. The oil in Eastern Colorado has valuable byproducts that can be sold in other markets.

- An important issue for oil and gas pipeline development is obtaining the right-of-way on private property. Right-of-way approval is becoming more difficult with local governments in the state for expansion of liquid petroleum pipelines.
- Along with export markets it is important to examine what the state can do to increase use of energy resources that are produced within the state.
- There is a concern that the increased integration of wind energy into the grid is a barrier to future growth of wind development. The future development of transmission lines will be important to wind development in the region.
- A wind integration study conducted on HEAs distribution system showed that approximately 100
   MW of wind turbine capacity could be installed. However, at this time, it does not seem to be economically practical to develop a project that would be spread out across the entire HEA system.
- Northeast Colorado may currently be in a position that locks out any future wind developers from seeking projects without new transmission capacity in the region.
- Local level permitting may be the primary challenge to transmission development. Addressing local level permitting will involve the Public Utilities Commissions, counties, and cities. Senate Bill 07-100 could provide some solutions for permitting that would provide a more streamlined permitting process.
- Xcel Energy has been working closely with the National Renewable Energy Laboratory to improve wind capacity planning and forecasting. Forecasting at Xcel Energy's wind sites is currently down to 15 minute segments.
- Tri-State schedules wind in its system 24 hours in advance of delivery. At times, the forecasts have been up to 15 percent off from what was scheduled. Tri-State operates in a transmission environment with potential penalties if they are over or under what they have forecasted for delivery. As wind increases in the system, forecasting may become more difficult.
- Near Fleming, CO, Tri-State has 97 MW of wind capacity coming online. The energy produced from the project will go to the Tri-State system and not the local REA.
- One national example of the obstacles and challenges to infrastructure development due to a lack of
  communication with local communities was the Keystone pipeline.. The effectiveness of future
  transmission and pipeline development will require maintaining transparency and open
  communication during the planning process. Landowners should be consulted during the process,
  and not told what to do.
- The High Plains Express was a recent transmission project considered for the Eastern Plains region of Colorado. Initially, the planning effort was to involve a state role in facilitating with counties to support the project. Similar to the High Plains Express, Tri-State has difficulty in developing transmission in different areas of the state. An approach that streamlines the process would be helpful.

# **Federal and State Regulations - Discussion Points**

- The state could be more active engaging with federal agencies on oil and gas regulations. Oil and gas
  production companies active in the state have significant senior water rights. Several of these
  companies are being asked to give up their water rights by the federal government as part of their
  agreement to produce on federal lands.
- Many federal regulations could be deferred to the state level rules for oil and gas development. In many cases, these federal regulations create confusion with state rules. The state is typically ahead of the federal government on the development of appropriate regulations.

#### **Infrastructure Modernization - Discussion Points**

- EPRI has been conducting an Advanced Metering Infrastructure (AMI) study for HEA and Y-W's system. The study should be completed within the next month and provide functional requirements for the region to install AMI. Following the study, Y-W expects to distribute a Request for Proposals that will allow them to select a vendor for the installation of AMI meters on the entire Y-W system.
- There are challenges to making infrastructure improvements among the region's REAs that contain a relatively small number of customers and long distances between customers.
- Use of propane requires the development of an infrastructure for vehicle fueling to allow more people across Colorado to take advantage of this locally sourced fuel. There is an interest in support from the Colorado Energy Office to help develop a propane infrastructure for vehicles.
- Oil and gas companies are seeking greater collaboration and are currently participating on health impact studies and emissions studies. Colorado is known for this type of private and public partnership for research.
- Xcel Energy faced significant challenges with regulations for smart meters because they were the
  first to implement the meters in local areas. In some cases, inspectors required homes to be regrounded, which added a cost of \$2,500 to the installation.

### **Alternative Fuel Vehicles - Discussion Points**

- In the 1970s, when gasoline prices reached historic highs, several farmers and contractors in the region had propane tanks in their trucks. There is not a large amount of propane fueling infrastructure in the region today.
- Propane buses are about the same cost as diesel buses, and the fuel equivalent for propane is currently about half the price. Propane fuel should be considered as a cost effective solution for fleets of vehicles.
- Local government permitting may cause barriers for compressed natural gas and propane stations in the region.
- There is a concern that incentives and mandates will inappropriately pick one technology winner over others. A fuel neutral approach may be better for allowing multiple technologies to develop.
- There is concern that electric vehicles currently do not have the range to be a reliable vehicle for the region.
- The major growth in AFVs could come mainly from fleets that will require collaboration and partnerships.

Air quality benefits from propane and natural gas vehicles are substantial compared to gasoline
vehicles. There may be effective incentives to consider for those vehicles to address air quality
issues. The requirements of current federal air emission rules today for off-road vehicles have not
created the incentive to choose CNG or propane vehicles over diesel vehicles, because the
requirements can still be met cost effectively by diesel engines

## **Technology R&D - Discussion Points**

- The oil and gas industry has had positive and negative experiences with studies on air emissions. An important element for research is to include private sector stakeholders as part of the research effort. With the appropriate stakeholder involvement, the research can be transparent and ensure that stakeholder participation mechanisms exist for comments.
- A number of farms in the region have converted their diesel tractors to run on biodiesel. Farmers in collaboration with researchers have been successful in growing sunflowers and/or soy beans for feedstock.

## **General Business Development - Discussion Points**

- A concern for utilities is a lack of engineers available to hire. There is an interest in having the state provide more support for science, technology, engineering, and math (STEM) education to facilitate an increase in engineering graduates.
- The oil and gas industry is in need of more skills in process safety management as well as STEM.
- It is important to provide training for the maintenance of propane, natural gas, and other alternative fuel vehicle infrastructure and refueling stations. The training may involve fire safety as it relates to CNG and propane infrastructure. In some cases the training may be as short as 15 minutes to train local fire departments on the basics of fuel properties.